

AMENDMENT

In the claims:

Please amend claims 27, 37, 43, and 44 to read as follows.

27. (Amended) A composite grating, comprising:

(a) an active material; and

(b) an ordered assemblage of subgratings supported by the active material for receiving input pulses along an input path and transmitting output pulses along an output path, wherein

(1) each subgrating satisfies a grating condition so as to diffract a respective subbandwidth of light from the input path to the output path, and

(2) the subgratings are configured such that (i) a first input optical pulse, incident to the active material along the input path and having a first input address encoded or image encoded waveform, produces an output optical pulse having a prescribed output temporal waveform and propagating along the output path, and (ii) a second input optical pulse, incident to the active material along the input path and having a second address encoded input waveform, different from the first encoded address or image, does not produce an output optical pulse having the prescribed output temporal waveform, and propagating along the output path.

37. (Amended) An optical waveform detector comprising:

(a) a detector capable of detecting light pulses having a prescribed detectable temporal waveform;

(b) a composite grating for receiving light pulses along an input path and transmitting light pulses to the detector along an output path, the composite grating comprising:

(1) an active material; and

(2) an ordered assemblage of subgratings supported by the active material

wherein

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(i) each respective subgrating satisfied at least one of a Bragg condition or a surficial grating condition so as to diffract a respective subbandwidth of light from the input path to the output path, and

(ii) the subgratings are so configured such that an input optical pulse interacting with the active material along the input path and having a prescribed address encoded input temporal waveform triggers an output optical pulse along the output path having the prescribed detectable temporal waveform, the prescribed detectable temporal waveform being different from the prescribed input temporal waveform.

43. (Amended) A communications system comprising:

(a) a source of optical data, the data comprising optical light pulses, each pulse having one of a set of specific address encoded temporal waveforms;

(b) a detector capable of detecting an optical pulse having a prescribed detectable temporal waveform different from each of the set of specific temporal waveforms; and

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(c) a composite grating arranged to receive the light pulses from the source and to transmit, in response thereto, output light pulses along an output path to the detector, the grating comprising an ordered assemblage of subgratings supported by an active material, wherein

(1) each respective subgrating satisfies at least one of a Bragg condition or a surficial grating condition so as to diffract a respective subbandwidth of light from the source to the output path, and

(2) the subgratings are so configured such that

(i) an optical pulse received from the source, interacting with the active material and having a prescribed one of the set of specific temporal waveforms, triggers an output optical pulse along the output path having the prescribed detectable temporal waveform, and

(ii) an optical pulse received from the source, interacting with the active material along the input path and having one of the set of specific temporal waveforms other than the prescribed one, does not trigger an output optical pulse along the output path having the prescribed detectable temporal waveform.

44. (Amended) An optical-waveform-sensitive routing system comprising:

(a) a router responsive to change the routing of data in response to an optical pulse having a prescribed detectable temporal waveform; and

(b) a composite grating for receiving input light pulses along an input path and transmitting, in response thereto, output light pulses to the router along an output path, the grating comprising an ordered assemblage of subgratings supported by an active material wherein

(1) each respective subgrating satisfies at least one of (i) a Bragg condition or (ii) a surficial grating condition so as to diffract a respective subbandwidth of light from the input path to the output path, and

(2) the subgratings are so configured such that an optical pulse received by the composite grating, interacting with the active material along the input path and having a prescribed address encoded input temporal waveform different from the prescribed detectable temporal waveform, triggers an output optical pulse along the output path having the prescribed detectable temporal waveform.